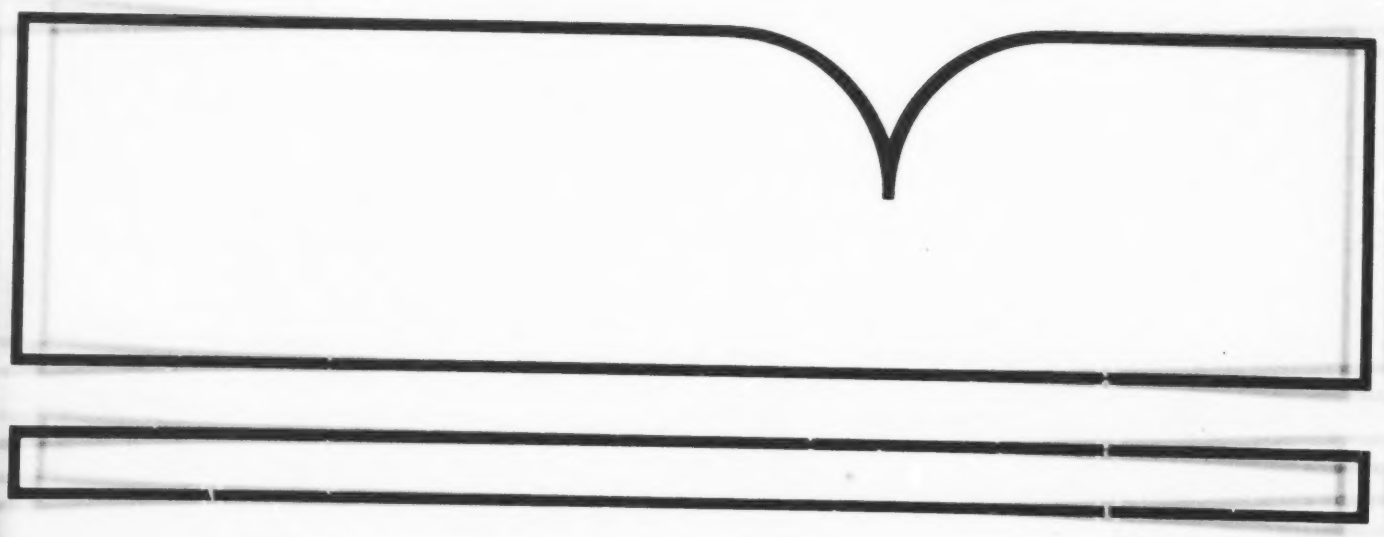
PB88-242813

Review of the NAAQS (National Ambient Air Quality Standards) for Particulate Matter: Assessment of Scientific and Technical Information. Final Report

(U.S.) Environmental Protection Agency
Washington, DC

16 Dec 86



U.S. Department of Commerce
National Technical Information Service
NTIS

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. SAB-CASAC-87-010	2.	3. PB88-242813
4. Title and Subtitle (Review of the NAAQS for Particular Matter: Assessment of Scientific and Technical Information)			5. Report Date Dec. 16, 1986
			6.
7. Author(s) Clean Air Scientific Advisory Committee			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Environmental Protection Agency Science Advisory Board 499 S. Capitol Street, SW Washington, D.C. 20460 (A101F)			10. Project/Task/Work Unit No.
			11. Contract(C) or Grant(G) No. (C) (G)
12. Sponsoring Organization Name and Address Environmental Protection Agency 401 M Street, SW Washington, D.C. 20460 (A101)			13. Type of Report & Period Covered Final Report
			14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The Committee concluded that this document is consistent in all significant respects with the scientific evidence presented and interpretation in the combined Air Quality Criteria Document for Particulate Matter/Sulfur Oxides and its 1986 Addendum. The Committee believes that this document should provide the kind and amount of technical guidance that will be needed to make appropriate revisions to the standards. Major conclusions and recommendations concerning the scientific issues and studies discussed in the Staff Paper Addendum are detailed in the report.

17. Document Analysis a. Descriptors

National Ambient Air Quality Standards (NAAQS)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages 5
	20. Security Class (This Page)	22. Price A02 · 9.95

SAB-CASAC-87-010

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON D C 20460

December 16, 1986

OFFICE OF
THE ADMINISTRATOR

The Honorable Lee Thomas
Administrator
U.S. Environmental Protection
Agency
Washington, DC 20460

Dear Mr. Thomas:

The Clean Air Scientific Advisory Committee (CASAC) has completed its review of the 1986 Addendum to the 1982 Staff Paper on Particulate Matter (Review of the NAAQS for Particulate Matter: Assessment of Scientific and Technical Information) prepared by the Agency's Office of Air Quality Planning and Standards (OAQPS).

The Committee unanimously concludes that this document is consistent in all significant respects with the scientific evidence presented and interpreted in the combined Air Quality Criteria Document for Particulate Matter/Sulfur Oxides and its 1986 Addendum, on which the CASAC recently issued its closure letter. The Committee believes that this document provides you with the kind and amount of technical guidance that will be needed to make appropriate revisions to the standards. The Committee's major findings and conclusions concerning the various scientific issues and studies discussed in the Staff Paper Addendum are contained in the attached report.

Thank you for the opportunity to present the Committee's views on this important public health issue.

Sincerely,

Morton Lippmann

Morton Lippmann, Ph.D.
Chairman
Clean Air Scientific Advisory
Committee

cc: A. James Barnes
Gerald Emison
Vaun Newill
John O'Connor
Craig Potter
Terry Yosie

SAB-CASAC-87-010

SUMMARY OF MAJOR SCIENTIFIC ISSUES AND CASAC CONCLUSIONS ON THE 1986 DRAFT ADDENDUM TO THE 1982 PARTICULATE MATTER STAFF PAPER

The Committee found the technical discussions contained in the Staff Paper Addendum to be acceptable with minor revisions.

Particle Size Indicator

The CASAC reaffirms its January 29, 1982 recommendation that a particle size indicator that includes only those particles less than or equal to a nominal 10 um aerodynamic diameter, termed PM_{10}, is appropriate for regulation of particulate concentrations. This judgment is based on analysis of the earlier available data, and the analysis of the recent scientific studies discussed in the 1986 Addendum to the Air Quality Criteria for Particulate Matter/Sulfur Oxides and the 1986 Addendum to the Particulate Matter Staff Paper.

Implications of London Mortality Studies

Further analyses of the London mortality studies, including recent analysis by Agency staff, suggest that:

1) the data provide no evidence for a threshold for the association between airborne particles and daily mortality or a change of coefficient with changes in particle composition;

2) mortality effects can be associated with PM alone (with or without sulfur oxides);

3) there is no reliable quantitative basis for converting British Smoke (BS) readings to PM_{10} gravimetric mass at low (<100-200 ug/m^3) BS levels, and hence the mortality data are not readily useful for establishing a lower bound for 24-hour PM_{10} NAAQS, although the suggestion of mortality at relatively low PM levels must be given serious consideration in selecting a margin of safety.

Interpretation of Lung Function Studies for 24-hour Standard

Although the lung function decrements observed in children during and after air pollution episodes are of uncertain health significance, the two episodic lung function studies (Dockery et al., 1986; Dassen et al., 1986) are consistent with each other and the earlier work of Stebbings. They provide a relatively sensitive indication of possible short term physiological responses. Given the difficulty in deriving a lower limit from the mortality studies, these lung function studies can be useful in determining lower bounds for a 24-hour PM_{10} standard.

Interpretation of the Six Cities Study for Annual Standard

In general, the Committee felt that the six cities data are useful in establishing the lower bound of the range for the annual standard. In addition, the following are suggested by the data:

1) Cough and bronchitis, as defined in this study, are about twice as prevalent in children living in cities with PM_{10} in the range of 40-60 ug/m^3, in comparison to cities with 20-30 ug/m^3;

2) Because factors other than particulate matter may affect the inter-city differences, it is difficult to determine whether these associations should be designated as "likely" health effects;

3) The results are consistent with the Ostro studies in terms of morbidity responses at long-term average particulate matter exposures within current particulate ambient air quality standards; and

4) The results are consistent with the Bouhuys study in terms of symptoms without changes in pulmonary function.

Ranges for 24-hour and Annual Standards for PM_{10}

In its January 2, 1986 letter to the Administrator, the CASAC noted that its preliminary analyses of the more recent data do not indicate the need for fundamental changes in the structure of the proposed particle standards; however, the Committee pointed out that these new data suggest the need to focus consideration on standards at or perhaps below the low ends of the ranges proposed in the March 20, 1984 Federal Register Notice. The ranges of interest then proposed were 150-250 ug/m^3 for 24-hour standard, and 50-65 ug/m^3 for annual standard.

Since then, EPA staff have proposed updated ranges of interest for both the 24-hour standard (140-250 ug/m^3), and the annual standard (40-65 ug/m^3), based on short-term and long-term epidemiological data, respectively. The Committee finds these ranges of interest reasonable, given the scientific data and related uncertainties; however, a final decision should also weigh evidence from clinical and toxicological studies as well. The Committee agrees with EPA staff that selection of final standards must include consideration of the combined protection afforded by the 24-hour and annual standards taken together.

The Committee recommends that you consider setting the revised standards at the lower ends of the proposed ranges for both the 24-hour and annual standards. The Committee recognizes that the exact levels to be chosen for the 24-hour and annual standards represent a policy choice, influenced by the need to include a margin of safety. Given the uncertainty in the supporting scientific data, the Committee cannot distinguish the health effects that may be observed at different levels near the lower bound, such as the health significance of setting the 24-hour standard at 140 ug/m^3 compared to 150 ug/m^3.